

Compact High-Performance Laser Gyro, Phase I

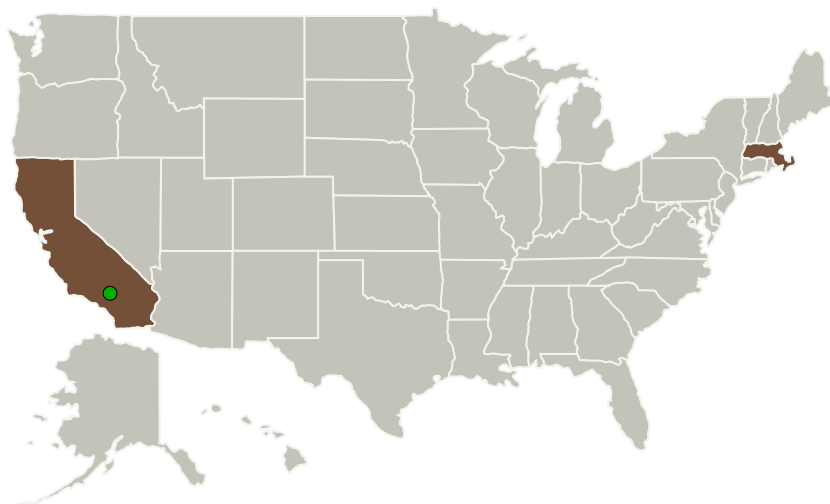
Completed Technology Project (2013 - 2013)



Project Introduction

The rotation sensitivity of a conventional optical Inertial Navigation System (INS) depends on the area enclosed by a circular optical path. Hence, it is impossible to significantly reduce the device size without sacrificing its sensitivity. Recent work showed that certain non-linear optical effects (fast light) can be used to increase the sensitivity of a ring laser gyro of a given size by orders of magnitude. We propose a portable high-performance all-fiber laser gyroscope. The device will utilize fast light produced by the Stimulated Brillouin Scattering in single-mode fibers. Fast light enhancement will enable reduction of the device size without decreasing its performance level. The fast light enhanced gyroscope will empower a rugged, compact, low-cost high-sensitivity INS ideal for precision guiding of UAVs, and other aircrafts.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
MagiQ Technologies, Inc.	Lead Organization	Industry	Somerville, Massachusetts
● Armstrong Flight Research Center (AFRC)	Supporting Organization	NASA Center	Edwards, California



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Primary U.S. Work Locations

California

Massachusetts

Project Transitions

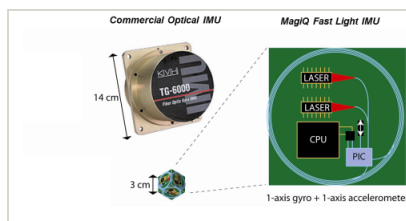
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138045>)

Images



Briefing Chart

Compact High-Performance Laser Gyro, Phase I
(<https://techport.nasa.gov/image/136757>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MagiQ Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

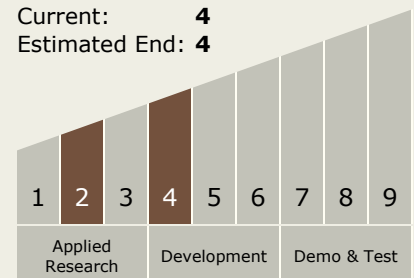
Carlos Torrez

Principal Investigator:

Caleb A Christensen

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
 - └ TX17.2 Navigation Technologies
 - └ TX17.2.3 Navigation Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System